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Guaranty Trust Company  
of New York

Amortization

[New York]

[c1917]

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# Amortization

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Guaranty Trust Company  
of New York

NEW YORK  
YOUNG & RUBIN  
1911

# Amortization

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Some notes of interest to investors, executors,  
trustees, and beneficiaries under trusts

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Guaranty Trust Company of New York  
140 Broadway

PARIS OFFICE  
Rue des Italiens, 1 & 3

FIFTH AVENUE OFFICE  
Fifth Avenue and 43d Street

LONDON OFFICE  
32 Lombard St., E. C.

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GUARANTY TRUST COMPANY OF NEW YORK

REVISED, 1917 SET

## Amortization

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IN the absence of specific instructions in deeds of trust or wills, those charged with the administration of trust funds are required by the laws of the State of New York to invest in

Bonds and mortgages on unincumbered real property in this State worth 50% more than the amount loaned thereon.

The securities in which savings banks are authorized to invest.

The latter class of investments, on account of the nature of the security, commonly commands a premium, which is lost if the bond is held until maturity. This loss must be charged either against principal or income. If charged against income, it should not be written off at one time, but should be absorbed by amortization.

Amortization, as herein discussed, is the gradual charging off and extinction of the premium paid for a bond, by setting aside at each interest period a certain amount of the fixed interest the bond bears, the amounts set aside being so calculated that at the maturity of the bond they will equal the premium paid.

Under decisions handed down by the Court of Appeals of this State, it has been held that in the absence of a clear direction in a will to the contrary, where a testamentary trustee purchases, at a premium, bonds having a term of years to run, such a proportionate deduction should be made from the fixed interest as will make good, at the maturity of the bond, the premium paid and thus preserve the principal of the fund intact; in other words, the premium should be amortized.<sup>1</sup>

The language of the will and the surrounding circumstances might indicate a different intention on the part of the testator, in which case his intent would control, but to justify an exception to the rule, the intent should be expressed in the very clearest manner.<sup>2</sup>

The failure of the testator to cause it to appear clearly in the will whether the wearing away of premiums should fall upon principal

<sup>1</sup> The Courts have held that when securities purchased by the creator of the trust are received by the trustee the whole interest received should be treated as income and that the life tenant should not be charged with any part of the premium at which such securities may have been inventoried.

<sup>2</sup> If it is desired that the life tenant shall receive the full income from securities purchased at a premium without providing for the gradual extinction of such premium so as to bring them to par at maturity, the intent should be declared in phraseology such as the following:

"The trustee named herein is hereby directed to charge all premiums on investments against principal and not against income."

or income, has given rise to litigation and has necessitated the construction of wills by the Court, after considering the condition of the parties in interest and the surrounding circumstances, in order to determine the relative rights of life tenants and remaindermen. In some cases the expense to the estate has been greater than the amount involved. When it is incumbent upon a trustee to preserve the principal of the estate intact, the object is the protection of the remaindermen.

For instance, if a \$1,000 bond having 20 years to run, bearing interest at 4% payable semi-annually, were purchased at 110% or for \$1,100, when the bond matures and is paid at its face or par value, the \$100 premium would be lost if it had not been amortized, and the estate depleted to the injury of the remaindermen.

The interests of the life tenant must also be considered.

If the trustee charged the whole amount of the premium paid, against accumulated income at the time of the purchase in the instance above given, he would exhaust the semi-annual interest received on the bond for two and one-half years. If the life tenant died during or at the end of that time he would have received no return whatever from the investment; therefore, the premium should be reduced gradually, i. e., by amortization.

If a bond is purchased above par, the rate of interest earned on the sum invested is less than the rate of interest the bond pays on its face or par value. The rate of interest earned on the *sum invested*, as distinguished from the rate of interest received on the *par value* of the bond is termed *the basis*. To determine the basis it is necessary to know:

First, the purchase price of the bond.

Second, the fixed interest it bears.

Third, the number of interest payments during year.

Fourth, the number of years to maturity.

These facts being ascertained, the basis may be found in a table of bond values.

If a bond of the par value of \$1,000, maturing in seven years, bearing interest at 5% payable semi-annually, is purchased for \$1,060.53, the investment earns only 4%. The bond has been purchased on a 4% *basis*.

At the end of the first six months the interest earned on the investment is \$21.21 (at the rate of 4% per annum on \$1,060.53), the interest received on the par value of the bond is \$25.00, the difference between the two amounts being \$3.79.

[ 6 ]

The theory of scientific amortization is that the difference between the interest earned on the investment and the interest received on the par value (in the example given, \$3.79) is not income but principal. As a bond purchased above par approaches maturity there is an inherent and intrinsic depreciation in its value, and the amount of this depreciation at each interest period is the difference between the "interest *earned*" and the "interest *received*." This may be proven by reference to tables of bond values, where it will be seen that:

The value of a 5% bond purchased on a 4% basis with seven years to run is	\$1060.53
The value of the same bond with six and one-half years to run is.....	1056.74
The depreciation during the first interest period being.....	\$3.79

On the theory that this amount (\$3.79) is principal, it should not be paid to the life tenant, but should be returned to the principal of the estate for reinvestment, thereby reducing the cost of the bond, as shown by the trustee's books. The income from this reinvestment would, of course, be paid to the life tenant.

[ 7 ]

This gives rise at each interest period to a new book value upon which the life tenant receives interest at the investment basis, and the difference between this sum and the interest received on the par value of the bond is returned to principal for reinvestment. If this process is continued to the maturity of the bond, the book value becomes the par value, and the amount returned to principal exactly equals the premium paid.

From TABLE I (on page 10) it will be seen:

- (1) that the amount to be paid the life tenant at each interest period is always at the rate of 4% per annum on the book value of the bond;
- (2) that the amortization at each period is always the difference between the interest on the par value of the bond, and the interest on its book value at the investment basis rate;
- (3) that the book value of the bond at any given period is always the sum the estate would receive, if the bond were sold on the same basis at which it was purchased;
- (4) at any period the book value of the bond and the aggregate of the amounts set aside by amortization exactly equal the amount of the original investment;
- (5) that at the maturity of the bond the total amount amortized equals the amount of the premium paid for the bond.



TABLE I

## EXAMPLE

A 5% bond, with seven years to run, purchased January 1, 1910, on a 4% basis:

	Interest on Par Value	Interest earned 4% Basis	Amortization	Book Value	Par Value
Jan. 1, 1910	Cost. . . . .	.....	.....	\$1,060.53	\$1,000
July 1, 1910	\$25	\$21.21	\$3.79	1,056.74	
Jan. 1, 1911	25	21.14	3.86	1,052.88	
July 1, 1911	25	21.05	3.95	1,048.93	
Jan. 1, 1912	25	20.98	4.02	1,044.91	
July 1, 1912	25	20.90	4.10	1,040.81	
Jan. 1, 1913	25	20.82	4.18	1,036.63	
July 1, 1913	25	20.73	4.27	1,032.36	
Jan. 1, 1914	25	20.65	4.35	1,028.01	
July 1, 1914	25	20.56	4.44	1,023.57	
Jan. 1, 1915	25	20.47	4.53	1,019.04	
July 1, 1915	25	20.38	4.62	1,014.42	
Jan. 1, 1916	25	20.29	4.71	1,009.71	
July 1, 1916	25	20.19	4.81	1,004.90	
Jan. 1, 1917	25	20.10	4.90	1,000.00	
	\$350	\$289.47	\$60.53		

TABLE II

There is another method of amortization, termed the Pro-rata Method

## EXAMPLE

	Interest on Par Value	Interest less Amortization	Amortization	Book Value	Par Value
Jan. 1, 1910	Cost. . . . .	.....	.....	\$1,060.53	\$1,000
July 1, 1910	\$25	\$30.63	\$4.37	1,056.16	
Jan. 1, 1911	25	20.68	4.32	1,051.84	
July 1, 1911	25	20.68	4.32	1,047.52	
Jan. 1, 1912	25	20.68	4.32	1,043.20	
July 1, 1912	25	20.68	4.32	1,038.88	
Jan. 1, 1913	25	20.68	4.32	1,034.56	
July 1, 1913	25	20.68	4.32	1,030.24	
Jan. 1, 1914	25	20.68	4.32	1,025.92	
July 1, 1914	25	20.68	4.32	1,021.60	
Jan. 1, 1915	25	20.68	4.32	1,017.28	
July 1, 1915	25	20.68	4.32	1,012.96	
Jan. 1, 1916	25	20.68	4.32	1,008.64	
July 1, 1916	25	20.68	4.32	1,004.32	
Jan. 1, 1917	25	20.68	4.32	1,000.00	
	\$350	\$289.47	\$60.53		

NOTE: In this case the first amortization is chargeable with the odd cents arising from the division of \$60.53 by 14

In pro-rata amortization as shown in TABLE II (on page 11) the premium is divided by the number of interest periods during the term of the bond and the quotient is written off the cost of the bond and set aside for re-investment at each interest period.

By comparison, it will be seen that in scientific amortization the amount of income to be paid the life tenant from the bond, whose premium is being amortized, decreases at each interest period, while in pro rata amortization it remains the same.

In the scientific method the bonds, whose premium is being amortized, are always carried on the trustee's books at the basis of purchase, that is, the book value is decreased at each interest period by the amount of the amortization. The amount of interest to be paid the life-tenant from the bonds is calculated on the book value at the rate at which the original investment was made, and, therefore, his income from that source decreases at each interest period; but in addition to the interest on the book value of the bonds, he receives the interest from

re-investment of the amortization fund. As that fund and the book value of the bonds always equal the amount of the original investment, the total income paid to the life-tenant is always at the basic rate on the amount of the original investment. The values given in bond tables are computed on the basis of re-investment of the amortization fund, at the same basic rate, and such re-investment is therefore an essential of scientific amortization.

In the pro-rata method the bonds are not carried on the trustee's books at the actual basis of purchase, inasmuch as the periodic amortization is only approximated; and because the amortization deducted from the bond interest at each period in this method, is always the same, the income to be paid the life-tenant from this source does not vary. The interest on the amortization fund, however increases at each period, and, therefore, the total income paid to the life-tenant is less during the earlier, and more during the later periods than is warranted by the actual return on the investment.

When applied to small amounts of bonds of short maturity, this method does substantial justice between life-tenants and remaindermen and complies with the legal requirements; but from the examples given in Tables III and IV, it can be seen that, when large amounts are involved, the scientific method must be used to do justice to all parties.

TABLE III

## EXAMPLE

Scientific amortization of the book value of bonds purchased at a premium. \$100,000, 5% bonds with seven years to run, purchased January 1, 1910 on a $\frac{1}{2}\%$ basis.									
	Book Value	Interest on Par Value	Scientific Amortization	Interest at $\frac{1}{2}\%$ on Book Value	Int. at $\frac{1}{2}\%$ on Amort. Fund	Total Int. to Pay 4% on Cost			
Jan. 1, 1910	\$106,053.12 Cost	.....	.....	.....	.....	.....			
July 1, 1910	105,674.19	\$2,500	\$878.93	\$2,121.07	\$ 0.00	\$2,121.07			
Jan. 1, 1911	105,287.67	2,500	386.52	2,113.48	7.59	2,121.07			
July 1, 1911	104,893.42	2,500	394.25	2,105.75	15.32	2,121.07			
Jan. 1, 1912	104,491.29	2,500	402.13	2,097.87	23.20	2,121.07			
July 1, 1912	104,081.12	2,500	410.17	2,089.83	31.24	2,121.07			
Jan. 1, 1913	103,662.74	2,500	418.38	2,081.62	39.45	2,121.07			
July 1, 1913	103,236.00	2,500	426.74	2,073.26	47.81	2,121.07			
Jan. 1, 1914	102,806.72	2,500	435.28	2,064.72	56.35	2,121.07			
July 1, 1914	102,376.73	2,500	443.99	2,056.01	65.06	2,121.07			
Jan. 1, 1915	101,903.86	2,500	452.87	2,047.13	73.94	2,121.07			
July 1, 1915	101,441.94	2,500	461.92	2,038.08	82.99	2,121.07			
Jan. 1, 1916	100,970.78	2,500	471.16	2,028.84	92.23	2,121.07			
July 1, 1916	100,490.20	2,500	480.58	2,019.42	101.65	2,121.07			
Jan. 1, 1917	100,000.00	2,500	490.20	2,009.80	111.27	2,121.07			
Amortization	6,053.12	\$35,000	\$6,053.12	\$28,946.88	\$748.10	\$29,694.98			
Plus Par Value=Cost	\$106,053.12								

Note: Total Interest to the Life Tenant in this method is the same at each interest period.

TABLE IV

## EXAMPLE

Pro-rata amortization of the book value of bonds purchased at a premium.

\$100,000, 5% bonds with seven years to run, purchased January 1, 1910 on a 4% basis.									
	Book Value	Interest on Par Value	Pro-rata Amortization	Int. on Par Value Less Amortization	Int. at 4% on Amort. Fund	Total Interest to Life Tenant			
Jan. 1, 1910	\$106,033.12	Cost	.....	.....	.....	.....	.....	.....	.....
July 1, 1910	105,620.68	\$2,500	\$432.44	\$2,067.56	\$0.00	\$2,067.56			
Jan. 1, 1911	105,188.32	2,500	432.36	2,067.64	8.65	2,076.29			
July 1, 1911	104,755.96	2,500	432.36	2,067.64	17.30	2,084.94			
Jan. 1, 1912	104,323.60	2,500	432.36	2,067.64	25.94	2,093.58			
July 1, 1912	103,891.24	2,500	432.36	2,067.64	34.59	2,102.23			
Jan. 1, 1913	103,458.88	2,500	432.36	2,067.64	43.24	2,110.88			
July 1, 1913	103,026.52	2,500	432.36	2,067.64	51.88	2,119.52			
Jan. 1, 1914	102,594.16	2,500	432.36	2,067.64	60.53	2,128.17			
July 1, 1914	102,161.80	2,500	432.36	2,067.64	69.18	2,136.82			
Jan. 1, 1915	101,729.44	2,500	432.36	2,067.64	77.82	2,145.46			
July 1, 1915	101,297.08	2,500	432.36	2,067.64	86.47	2,154.11			
Jan. 1, 1916	100,864.72	2,500	432.36	2,067.64	95.12	2,162.76			
July 1, 1916	100,432.36	2,500	432.36	2,067.64	103.77	2,171.41			
Jan. 1, 1917	100,000.00	2,500	432.36	2,067.64	112.42	2,180.06			
Amortization	6,053.12	\$35,000	\$6,053.12	\$23,946.88	\$786.91	\$20,738.79			
Plus Par Value = Cost	\$106,033.12								

Note: Total Interest to the Life Tenant in this method varies at each interest period.

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